

1KOMMA5°

1KOMMA5° FULL BLACK DOUBLE GLASS MODULE

- **N-Type Topcon module**
 - × Fullblack
 - × Double glass
 - × Bifacial
 - × Zero Busbar Design
- **High Power** up to 455Wp
- **1KOMMA5° Warranty**
 - × 30 years product
 - × 30 years linear performance warranty
- **Highest quality** and ethical standards
- **With polysilicon** from Germany



Designed in /
with raw materials from



FULL BLACK DOUBLE GLASS MODULE

MODULE SPECIFICATION

Cell type	N -type monocrystalline, 108(6×18)
Dimensions(L×W×H)	1,762×1,134×30 mm
Weight	24,4 kg
Front	2 mm tempered glass
Rear	2 mm tempered glass
Junction box	3 Diodes, IP68 » IEC 62790
Cable	4 m ² , 1,300 mm
Plug type (IEC)	MC4-EVO2A

ELECTRICAL DATA

Module	445 Wp		450 Wp		455 Wp	
Test conditions	STC ¹	NMOT ²	STC ¹	NMOT ²	STC ¹	NMOT ²
Nominal power (P _{mp} /Wp)	445	334.6	450	338.4	455	342.2
Nominal voltage (V _{mp} /V)	33.22	31.27	33.39	31.43	33.56	31.59
Nominal current (I _{mp} /A)	13.40	10.70	13.48	10.77	13.56	10.83
Open circuit voltage (V _{oc} /V)	39.20	37.23	39.40	37.42	39.60	37.61
Short-circuit current (I _{sc} /A)	14.19	11.46	14.28	11.53	14.36	11.59
Efficiency (%)	22.3		22.5		22.8	

MODULE CHARACTERISTICS

Max. System voltage (IEC/UL)	1,500 VDC
Max. fuse Rating	30 A
Fire protection class	A according to UL790
Maximum mechanical test load, Push/Pull (Pa)	Snow: 5,400 Wind: 2,400
Maximum design load, Push/Pull (Pa)	Snow: 3,600 Wind: 1,600
Performance tolerance	0 / +3 %
Protection class	II
Frame	Black anodised aluminium
Annual degradation (1st year)	≤ 1.0%
Annual degradation (2nd - 30th year)	Max. 0.4% per year

TEMPERATURE VALUES

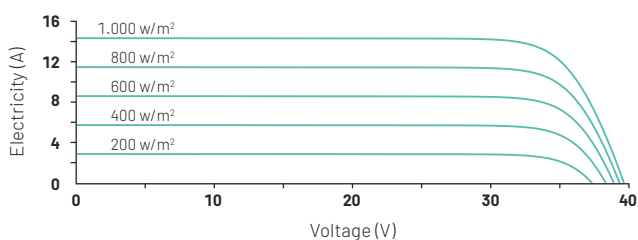
Temperature coefficient (P _{mp})	-0.29 %/°C
Temperature coefficient (I _{sc})	+0.043 %/°C
Temperature coefficient (V _{oc})	-0.25 %/°C
Nominal module operating temperature (NMOT)	41 ± 2°C
Operating temperature (°C)	-40 to +85

BIFACIAL POWER

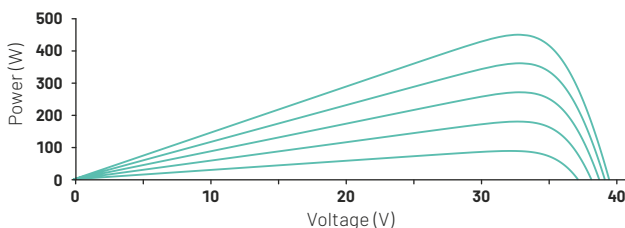
Module	445 Wp	450 Wp	455 Wp
5 % P _{max} (STC)	467.25	472.50	477.75
10 % P _{max} (STC)	489.50	495.00	500.50
15 % P _{max} (STC)	511.75	517.50	523.25
20 % P _{max} (STC)	534.00	540.00	546.00
25 % P _{max} (STC)	556.25	562.50	568.75

POWER CURVES

Current-voltage curve (450 W)



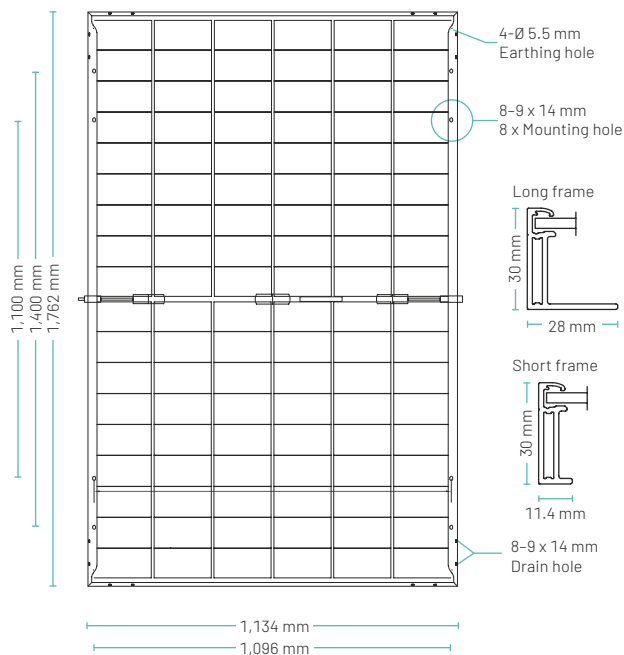
Power-voltage curve (450 W)



PACKAGING INFORMATION

Container	40' HQ
Pallet dimensions (L×W×H)	1,794×1,125×1,255 cm
Pieces per pallet	36
Pieces per container	936

TECHNICAL DRAWING



ZERTIFIZIERUNGEN

IEC 61215, IEC 61730	PID (IEC TS 62804)
Ammonia Corrosion Test: IEC 62716	LeTID (IEC TS 63342)
Salt Mist Corrosion Test: IEC 61701	

1 STC irradiation 1,000 W/m², cell temperature 25°C, AM = 1.5
2 NMOT irradiation 800 W/m², ambient temperature 20°C, AM=1.5, wind speed 1m/s

